WHAT IS CLAIMED IS:

1. A method for calibrating a frequency difference between two or more lasers over an extended frequency range, comprising:
tuning the lasers in coordination with respect to one or more readily characterized narrow frequency ranges to characterize one or more tuning parameters of each of the lasers over the extended frequency range.

2. The method of claim 1, wherein tuning the lasers in coordination includes:
calibrating the frequency difference with respect to the one or more tuning parameters over a first narrow frequency range;
calibrating the frequency difference with respect to the one or more tuning parameters over a second narrow frequency range; and
coordinating the resulting frequency difference calibrations for the first and second narrow frequency ranges to calibrate the frequency difference with respect to the one or more tuning parameters over the extended frequency range.

3. The method of claim 1, wherein the first and second narrow ranges frequency have at least one common calibration point

4. The method of claim 1, wherein the one or more tuning parameters includes a temperature of at least one of the lasers.

5. The method of claim 1, wherein tuning the lasers in coordination with respect to one or more readily characterized narrow frequency ranges to characterize one or more tuning parameters of each of the lasers over the extended frequency range includes:
measuring, with a frequency detector, a first value of a frequency difference between a signal from a first laser and a signal from a second laser, wherein the first frequency difference value lies within a finite range of the frequency detector;
fixing a parameter of the first laser to fix a frequency of the first laser;

varying a parameter of the second laser to vary a frequency of the second laser;

for one or more values of the second laser parameter, measuring, with the frequency detector, a second value of the frequency difference between the signal from the first laser and the signal from the second laser, wherein a frequency difference range between the first and second frequency difference values lies within the finite range of the frequency detector;

fixing the second laser parameter to fix the frequency of the second laser;

varying the first laser parameter to vary the frequency of the first laser; and

for one or more values of the first laser parameter, measuring, with the frequency detector, a third value of the frequency difference between the signal from the first laser and the signal from the second laser, wherein a frequency difference range between the second and third frequency difference values lies within the finite range of the frequency detector, and wherein a frequency difference range between the first and third frequency difference values extends beyond the finite range of the frequency detector.

6. The method of claim 5 wherein the frequency difference range between the first and second frequency difference values is substantially the same as the finite range of the frequency detector.

7. The method of claim 5 wherein the frequency difference range between the second and third frequency difference values is substantially the same as the finite range of the frequency detector, whereby the frequency difference range between the first and third frequency difference values is approximately twice the finite range of the frequency detector.

8. The method of claim 5, further comprising storing one or more pairs of values of the first and second laser parameters and one or more corresponding frequency difference values.

9. The method of claim 5 further comprising determining from the first, second and third values of the frequency difference one or more calibrated frequency difference values, wherein each of the one or more frequency difference values

corresponds to particular pair of values for the parameters of the first and second lasers.

10. The method of claim 9 wherein one or more of the first and second laser parameters is a laser temperature.

11. The method of claim 10 wherein the calibrated frequency difference values cover a frequency difference range that is greater than the finite range of the frequency detector.

12 The method of claim 1, wherein tuning the lasers in coordination with respect to one or more readily characterized narrow frequency ranges to characterize one or more tuning parameters of each of the lasers over the extended frequency range includes:

fixing a tuning parameter of a first laser;

varying a tuning parameter of a second laser,

measuring a frequency difference value between the first and second lasers that lies within a finite range ; and

associating a calibrated frequency difference value with a pair of values of the tuning parameters of the lasers.

13. The method of claim 1, wherein the frequency of at least one of the lasers is tuned by changing a temperature of the laser.

14. A computer readable medium having embodied therein a set of computer readable instructions for implementing a method for calibrating two or more lasers over an extended frequency range, the method comprising:

tuning the lasers in coordination with respect to one or more readily characterized narrow frequency ranges to characterize one or more tuning parameters of each of the lasers over the extended frequency range.

15. An apparatus for calibrating a frequency difference between a first laser and a second laser, the apparatus comprising:

means for tuning the lasers in coordination with respect to one or more readily characterized narrow frequency ranges to characterize one or more tuning parameters of each of the lasers over the extended frequency range.

16. An apparatus for calibrating a frequency difference between a first laser and a second laser, the apparatus comprising, comprising:
a first tuning controller coupled to the first laser;
a second tuning controller coupled to the second laser;
an optical coupler optically coupled to the first laser and the second laser;
a frequency detector coupled to the optical coupler; and
a controller coupled to the frequency detector and the first and second tuning controllers, wherein the controller includes a processor and a memory, the memory containing a set of instructions that are executable by the processor, the set of instructions implementing a method for calibrating a frequency difference between the first and second lasers over an extended frequency range, the method including

tuning the lasers in coordination with respect to one or more readily characterized narrow frequency ranges to characterize one or more tuning parameters of each of the lasers over the extended frequency range.

17. The apparatus of claim 16 wherein the frequency detector includes a local detector optically coupled to the optical coupler, a phase locked loop coupled to the local detector and the controller, an integrator coupled to the phase locked loop and the controller, a direct digital synthesizer coupled to the phase locked loop and the controller, and a crystal oscillator coupled to the direct digital synthesizer.

18. The apparatus of claim 17 wherein the crystal oscillator is NIST traceable.

19. The apparatus of claim 17 wherein the frequency detector further includes a pre-scaler coupled between the local detector and the phase locked loop.

20. The apparatus of claim 17 wherein tuning the lasers in coordination includes:

calibrating the frequency difference with respect to the one or more tuning parameters over a first narrow frequency range;

calibrating the frequency difference with respect to the one or more tuning parameters over a second narrow frequency range; and

coordinating the resulting frequency difference calibrations for the first and second narrow frequency ranges to calibrate the frequency difference with respect to the one or more tuning parameters over the extended frequency range.

21. An optical signal generator apparatus, comprising:

a first laser;

a second laser;

a first tuning controller coupled to the first laser;

a second tuning controller coupled to the second laser;

an optical coupler optically coupled to the first laser and the second laser;

a frequency detector coupled to the optical coupler; and

a controller coupled to the frequency detector and the first and second tuning controllers, wherein the controller includes a processor and a memory, the memory containing a instructions that are executable by the processor, the set of instructions implementing a method for calibrating a frequency difference between the first and second lasers over an extended frequency range, the method including

tuning the lasers in coordination with respect to one or more readily characterized narrow frequency ranges to characterize one or more tuning parameters of each of the lasers over the extended frequency range.

22. The apparatus of claim 21 wherein the crystal oscillator is NIST traceable.

23. The apparatus of claim 21 wherein the frequency detector further includes a pre-scaler coupled between the local detector and the phase locked loop.

24. The apparatus of claim 21 wherein tuning the lasers in coordination includes:

calibrating the frequency difference with respect to the one or more tuning parameters over a first narrow frequency range;

calibrating the frequency difference with respect to the one or more tuning parameters over a second narrow frequency range; and

coordinating the resulting frequency difference calibrations for the first and second narrow frequency ranges to calibrate the frequency difference with respect to the one or more tuning parameters over the extended frequency range.